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ABSTRACT

This paper focuses on the use of Gardner's (1985) Multiple Intelligence Theory (MIT) in the restructuring of the curriculum at elementary schools in Pawlet, Vermont. It discusses the state of education in Vermont, the need to restructure and improve assessment at the Pawlet schools, and the adoption of MIT to further this goal. The bulk of the paper consists of a lesson plan for an integrated unit of study that culminated in an all-school field trip to a nearby farm. The unit included linguistic, logical/math, visual/spatial, musical, kinesthetic, interpersonal, and intrapersonal activities. A teacher questionnaire on MIT, along with representative answers, is included. (MDM)

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THE PAWLET PROJECT: APPLICATIONS OF HOWARD GARDNER'S MULTIPLE INTELLIGENCE THEORY IN A RURAL VERMONT ELEMENTARY SCHOOL

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Paper presented at the 49th Annual Meeting of the Association for Supervision and Curriculum Development, Chicago, Illinois, March 18-22, 1994

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INTRODUCTION

This paper and the workshop in which it was distributed represents an attempt on the part of the authors to provide participants and readers with an introduction to Multiple Intelligence Theory as espoused by Dr. Howard Gardner, to consider a rationale for organizing elementary school instruction using such a theory as a guiding framework, and to introduce some applications of the theory and framework in one small, rural Vermont elementary school. As such, this is more a description of a school restructuring effort and a work in progress than it is a report of formal research. The Pawlet Project was not undertaken to test the validity of Gardner's theory. Gardner's conclusions relating to the existence of more than one or two intelligences were considered to be valid. Although some discussion took place around other multiple intelligence perspectives, such as those of Sternbergh, the focus really was on Gardner and his work.

In addition to being an example of M.I. Theory Application, the project cam also serve as a model for school-based change and the ways in which higher educational institutions can support that change. There is, at present, a modest study on these effects being conducted by the authors.

Paper presented at the 49th Annual Meeting of the Association for Supervision and Curriculum Development, Chicago, Illinois, March 18-22, 1994

THE CONTEXT

The Community

The town of Pawlet, Vermont sits on the border between Vermont and New York State and is one of the oldest towns in the state, having been founded before the Revolutionary War. It is a small place numbering only a few hundred inhabitants, looking very much like the typical rural New England village and remaining virtually unchanged for well over 150 years. People in this town make their living as dairy farmers in the now largely quiet slate quarries, or travel out of town to area businesses in the larger communities found in eastern New York. Although rural and small, Pawlet is not isolated.

Elementary education in Pawlet takes place in two school buildings, one housing the primary grades and the other housing the upper elementary grades. Both of these buildings are old wooden frame structures in need of repair and upgrading. A bond issue and building project have recently been proposed to accomplish that task. High school students from Pawlet must leave the community to attend high school elsewhere because there is no secondary school in the town. Like many border communities in Vermont, the closest facility is out of state, in this case Granville, New York, and several eighth graders each year elect to go there for their high school education.

The State

It will come as no surprise to an informed observer of American education that a lot has been going on in Vermont in recent years. Vermont as a state is also small and rural. Out of a population of about 550,000, roughly 100,000 students can be found in her public schools; grades pre-K through 12. Servicing those 100,000 students are approximately 8,000

teachers and administrators, half of which can be found working at the elementary level and the other half at the secondary level. Approximately one-third of these teachers and administrators are male and two-thirds female, with the average age being somewhere between 51 and 52 (Duval, 1990, p. 9).

For almost a decade now, Vermont has been in the throes of dramatic educational change. Spearheaded by a succession of progressive governors, one of whom, Madeleine Kunin, is now Assistant Secretary of Education in the Clinton administration, an equally progressive commissioner and state board and carried forward by a talented group of teachers and administrators, this state has made a serious attempt to define and implement an educational system for the 21st Century. Efforts in the area of alternative assessment, especially the development of student and school portfolios, curriculum development, school reorganization, alternative certification, and the redesign of teacher preparation programs in post-secondary institutions, have been recognized at the national and international level. These accomplishments are remarkable of themselves but perhaps even more so because of Vermont's unique system of governance for public education. Vermont is truly a bottom-up state. Although many Vermonters will contend that there is far too much in the way of state mandates and state control, if one compares Vermont to most other states in the nation, just the opposite set of conditions emerge. Most of the cost of education in Vermont is paid for at the local level, and that is where the control of education resides. This organizational context has among its pluses, high levels of energy and intensity of effort, great creativity, and by definition, multiple solutions to most problems. There are obviously, however, drawbacks including needless duplication of effort and - yes - exhaustion. Yet, as a rule, few Vermont

educators would elect to work in other places. With the exception of administrators, educator turnover is relatively low, producing a stability considered desirable for innovation implementation (Fullan, 1988).

The Idea

Educators in Pawlet were changing, trying to make their school a better place for children. Principal Mark was looking for a way to frame the reform effort, to focus energy, and to enable the process. Because so much energy was being put into assessment and so much work needed to be done in that area, Principal mark decided to hang her school improvement efforts on a student assessment framework. She approached John Duval of the Castleton State College education faculty in the early summer of 1992 to discuss ways in which the college could collaborate with the Pawlet School system and support this effort. These conversations led to a proposal that a course called "New Trends and Issues in Curriculum Development" be offered by Castleton on an outreach basis at Ms. Mark's school during the fall of 1992. Offering the course in the school would allow a maximum number of staff members to avail themselves of this opportunity and would free up resources from teachers' professional development monies to pay for the services of an instructor and logistical support for the course.

Although agreement was reached early about the structure of the course, its content was evolving slowly as a result of continued discussions between Mark and Duval. It was thought that it would be very useful for the group to share some readings and to discuss those as a way of developing a common view or vision of an assessment plan for the school. Parts of many of those discussions focused on the relationship between learning, teaching, and assessment. The authors agreed that the relationship between these three dimensions was interactive and/or reciprocal, and that by talking about them

at the same time, one could more easily map this relationship. It was in this way that a focus on Multiple Intelligence Theory emerged and the decision to read Frames of Mind by Howard Gardner was reached. The students and instructor would first read this book, consider how they then wished to view teaching and learning in their school, and then tackle the issues of how to assess it.

The Project

In late August of 1992, approximately ten teachers, including general classroom teachers, special educators and Principal Mark met with Dr. John Duval at the West Pawlet School to begin the process of learning about Multiple Intelligence Theory together and to consider ways in which that might change teaching and learning in their school. It was agreed that the course product would be a joint effort. Teachers described a series of documents which would outline or describe the restructuring efforts at the school. Class sessions each week would center on discussions of Frames of Mind as well as other readings, questions and issues that were emerging as the teachers read and talked among themselves. Central to this discussion was implementation of the theory in regular classrooms. Early in the fall of 1992, the teachers took a field trip to the Glouscester School System outside of Cambridge, Massachusetts. This system was attempting to implement M.I. Theory and had worked with Dr. Gardner and his team from Project Zero. For several reasons, what would have normally been a single semester course extended out into the entire year and, in retrospect, that may have contributed to the success of this school improvement effort in several ways. As the course continued, each teacher developed lessons and units which were governed by at least two overriding principles:

1. As you design this learning experience, how is teaching and learning

to occur in ways representing all of the intelligences?

2. As I assess the teaching and learning in this lesson or unit, how am I attending to the principles of M.I. Theory?

A culminating activity took place in the spring of the year where parents, the entire school population, and other interested citizens had an opportunity in a total immersion format to experience primary and elementary education organized according to the principles of M.I. Theory. A description of that experience is attached as an addendum to this paper and is represented for you in the Hyper Stack Program which Ms. Mark has prepared for you.

Next Steps

Recently, a survey was distributed to the teachers of the Pawlet School system. A copy of that survey has been attached to this document. Its purpose was to determine, among other things, to what extent M.I. Theory was still alive and well in the Pawlet schools and suggest ways in which future support for this change effort might take place. During a discussion of the survey and progress to date, Principal Mark indicated that plans for school building additions and renovations had been made within a multiple intelligence context. That meant, among other things, that the design of instructional space was to be carried out in such a way as to facilitate teaching and learning in new and different ways.

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Environmental Study at Southwind Farm: Integrating the Theory of Multiple Intelligence into the Pawlet School District's Science Curriculum and Assessment

Judy Bremer, Ann Hunt, Nancy Mark,
Meg Morris, Cindi Roberts, Dawn Robertson,
Mike Russo and Patty Winpenny
April 14,1993

Environmental Study at Southwind Farm: Integrating the Theory of Multiple Intelligence into the Pawlet School District's Science Curriculum and Assessment

Concept: Organization and Systems of Living Things

Theme: Investigating the Forest, Pond, Meadow and Man's Impact

Format: All-School Visit to the Southwind Farm, with Overnight Option

This unit of study is designed for grades K-6. The objective is to recognize the diversity of life, understand classification systems and to explore and study the ecosystems at the Southwind Farm through multiple intelligences.

On the day trip, Pawlet Schools' staff will be assisted by professional foresters, ELF staff, community volunteers and parents. They will explore the forest, pond, meadow and man's impact at the Southwind Farm through the seven intelligences by observing, touching, listening, using field guides, producing art, writing. Students will work both individually and in cooperative groups with adult facilitators.

The day will end with a celebration to thank everyone for their participation in the study.

Children can elect to camp overnight for further learning experiences, such as astronomy, the study of nocturnal wildlife and basic survival skills.

ORGANIZATION OF Southwind Farm STUDY UNIT

I. Pre-Trip Study for Students

Lesson 1. **Introduction to Southwind Farm** (prior knowledge). Teachers outline project, discuss goals and contracts with students.

Lesson 2. **Resources:** map of Southwind Farm, field guides, tree books, posters, forest service, parents, volunteers, Ecosystems computer program.

Lesson 3: **Preparing for an Overnight Trip to Southwind Farm Forest.** Set goals for study outdoors. Plan menu and budget for trip. Brainstorm items students need to bring for overnight in June.

Follow-up is trip to supermarket for food supplies.

II. Pre-Trip Orientation for Pawlet Staff and All Volunteers

Pawlet staff will conduct an orientation at the Southwind Farm in preparation for the field trip.

III. Environmental Study

1. Whole school divides into multi-aged groups for MI activities at Southwind Farm (see schedule below).

2. Sharing celebration: students share leaf collections, musical compositions, mime, tree biographies, poems; parents invited.

3. Overnight campers set up camp and conduct evening study. Return to school next morning.

IV. Environmental Study: Informal Assessment and Debriefing

1. Student participation and performance will be assessed by classroom teachers with input from volunteers.
2. Students, Pawlet staff and volunteers will evaluate the success of the day.

GUIDELINES FOR ORGANIZATION OF EDUCATIONAL PROGRAM

* flexible multi-aged groups

* electives: children choose two morning sessions and two afternoon sessions (afternoon sessions include rest and play for K-2)

* teachers each lead one "MI" activity with volunteer assistants

* snack time and rest or quiet time

* lunch in MI morning groups

* storytelling or music time shared by whole group

* re-grouping of multi-aged groups for afternoon activities

* set date and raindate (Thursday preferred)

RESOURCE PEOPLE

Elf Volunteers
Susan Cooper (weaving)
Tom Hopkins and Burr and Burton Environmental Studies class
Bud Coolidge and Eagle Scouts (for camping)
Biff Mithoefer (man's impact)
Phyllis Tarbell (nurse)
Jim Ross, logger
Bill McKenzie, Bear Paw Lumber
Malcolm Cooper, J.K.Adams
Tim Joseph, Orvis
Mike "Boney" Herrick, stone walls
Peter Moore, stone walls
Marchen Skinner, ferns and wildflowers
Marian McChesney, pottery ("fossil prints" from scavenger hunt)
"Hummingbird," native American weaving
Skip Weisner, wind and water power
Children's Art Exchange ("Picture of Health" theme)
Diane Strohm, National Forest Ranger (Manchester)
Bob Schoenemann (yoga)
Irene "Dobi" Gilles (mime)
Patty Bowen and Ellen Morey
Charlene McIntyre (singing camp songs)
David Hicks (wildcrafting)

Southwind Farm Schedule of Activities

8:15 - lv. PVS & WPS

8:30 - arr. and convene at Southwind Farm

8:45 - introduction to day, hand out maps, describe safety rules

9:00- 10:30 - Walk to site, snack, Class #1

10:45-12:00 - Class #2

12:00 - Picnic lunch at Class #2 site

12:30-1:15 - Return to base camp for storyteller and singing

1:30-2:30 - Class #3

2:45-3:45 - Class #4

3:45-4:00 - Return to seven designated MI centers, get banners and prepare for the procession.

4:15 -5:00 - Celebration: Staff, parents, children, guests. Parents take children home. Bus available for transportation home.

5:00: overnighters head to camp (make dinner, sing around campfire, do astronomy and nocturnal animal study)

Next day for campers: breakfast, break camp and return to schools

Environmental Study Activity Grid #1

Intelligence	Forest	Meadow
linguistic	journals poetry story writing	journals poetry story writing
logical/math	estimate number of trees tree identification orienteering	quadrant study wind and water power map reading
visual/spatial	make terrarium Meet a Tree, p. 129	Lie Down and Look, p.79
musical	Make an instrument from natural materials and make a song	Grass noises Sing meadow songs
kinesthetic	Reach Out and Touch a Tree, p.128	building stone wall
interpersonal	Blind walk Forest Foray, p.81	Camping
intrapersonal	Animal Reflection: if I were...	Animal Reflection: if I were... Yoga

Environmental Study Activity Grid #2

Intelligence	Pond and Stream	Man's Impact
linguistic	journal	oral history
logical/math	physical factors, p.108 graphing	estimate age, things in area
visual/spatial	drawing	Sketch or design a useful implement made from farm junk
musical	Sing pond songs Listen to sounds of brook	"Dump Gong" - make from junk Sing trash songs
kinesthetic	Mime of pond creatures Collect pond creatures	Role play various creatures reactions (Lorax, Return to Shady Glade)
interpersonal	Scavenger hunt	Cooperative sculpture
intrapersonal	Sounds of Silence	Reflecting on changes man's made and how Graf's ancestors' would feel if they saw farm today.

Scheduling / Grouping Kids for MI Activities

K-2 - 56 kids (7 learning stations = 8 kids per activity)

3-6 - 75 kids (7 learning stations = 10-12 kids per activity)

Children stay with set group of kids for morning activities, have lunch with them. There is an option to rearrange groups after lunch for afternoon activities.

Idea Webs

What Southwind Farm offers with suggested MI areas:

Nature walks (kinesthetic)
Tree ID (linguistic, nature guide and journals)
Farm animals and barns (musical)
Pond (logical, mathematical)
Meadows (visual, spatial)
Forest Management (interpersonal)
Wild Flowers and Herbs (kinesthetic - collecting and preparing)

ELF units to draw from:

animal habitats
forces of nature
trees
birds and nests, songs
forest floor

TO DO:

Finalize plan (educational program, meals, camping).
Finalize budget.
Solicit private contributions.
Ask for parent coordinators for each class.

Patty Winpenny
MI, Science Curriculum and Assessment

January 25, 1993

Concept: Organization of Living Things
Theme: Identifying and Classifying Deciduous and Coniferous Trees

This unit of study is designed for fifth and sixth grades. The objective is to recognize the diversity of trees in Vermont, to understand the classification system for them as a group of living things and to explore similarities and differences within this group through multiple intelligences.

Students will participate in an overnight field trip to Merck Forest and will meet with professional foresters. They will observe trees in their ecosystem and will gather leaf and conifer branches for a leaf collection. They will explore structural differences between trees and their foliage through writing, observation, touching, listening, using field guides, art work and group projects.

Lesson 1. **Introduction to Classification of Trees.** Discussion (prior knowledge). Students try to identify leaves and conifer branches. Teacher outlines unit, discusses goals and contracts with students.

Lesson 2. **Resources for Tree Identification:** field guides, tree books, posters, forest service, parents, friends. How to use a field guide. Small groups are given three leaves to identify with help of a field guide.

Lesson 3: **Preparing for an Overnight Trip to Merck Forest.** Set goals for leaf and tree study outdoors. Plan menu and budget for trip. Brainstorm items students need to bring for overnight in September.
(Follow-up is trip to supermarket for food supplies).

Lesson 4: **Field Trip.**

Lesson 5-7: **Field Trip Debriefing, Research, Special Projects, Leaf Identification for Collection.**

Lesson 8: **Unit Celebration:** Students share leaf collections, musical compositions, mime, tree biographies, poems; parents invited.

Organization of Living Things: Identifying and Classifying Deciduous and Coniferous Trees

The following are unit activities outlined by MI.

1. Linguistic:

Tree poem: write a poem about your favorite tree.
Read a poem by Robert Frost about a tree.
Write a biography of your favorite tree.

2. Musical:

On a windy day, go outside and listen to the sounds of rustling leaves. Does a large maple sound like a quaking aspen in the wind?

Compare the sounds of deciduous and conifer branches rustling in the wind. If you were blind, do you think you could tell the difference?

Compose a song on the glockenspeil or bells or other instruments that represents the sounds of falling leaves.

Research: what different woods used in making musical instruments and reeds? Can density of a wood change sound?

3. Logical-mathmatical:

Examine single and multiple leaf branches.

Estimate the number of leaves on a maple tree that is five feet high, 10 feet, 20 feet, 30 feet high. Do you think the number of leaves increases in multiples of ten or in another multiple? Explain.

Estimate a tree's age from the rings. Examine a trunk of a deciduous and a coniferous tree. Are they similar?

Examine color changes daily on a maple tree near your home. How is the rate of color change affected by temperature? By rainfall?

4. Spatial-Visual

Arrange your leaves in a binder for a collection. Make an interesting cover for the collection.

Draw or paint a picture of a deciduous and coniferous tree.

Draw a maple tree in the four seasons. What colors do you use?

Examine the breakdown of a bright red maple leaf as it dries up over time. Record the color changes.

Examine color changes daily on a maple tree near your home.

Make holiday wrapping paper. Dry beautiful autumn leaves. Paste them on white paper or spray paint them gold first.

5. Bodily -Kinesthetic

Go for a walk in the woods. Gather leaves and conifer branches with needles for your collection.

Do a mime of different trees shaking in the wind or of one tree in different weather.

Examine one tree: climb in it, touch it, smell it, dance around it, run around the perimeter of its shadow.

6. Interpersonal:

Organize a class day trip to the woods to examine trees and gather leaves for collections.

Organize a blind-walk through the forest. Try to identify trees blindfolded.

Organize an overnight camping trip to the forest. Gather leaves for collection, discuss forest management, how different wood burns differently for campfires.

Invite parent foresters into the classroom to lead the discussion and review of the leaf collections.

7. Intrapersonal

Find a special tree. Go to it when you are feeling happy, sad, depressed, energetic, or lazy. Write in your journal. Do you become "friends" with the tree? Does the same tree seem different to you when your mood is different?

Describe your favorite tree and why it appeals to you.

Assessment Narrative:

Teacher will examine and evaluate the students' product output and participation in the leaf study throughout all phases of the project (including collection itself, journals, tree biography, songs, involvement in field trip, etc.).

Students will sign a contract (as will parents) in which the student sets goals and heads toward accomplishment. The leaf collection is mandatory. In addition, each student chooses from three or four projects representing different MIs for final evaluation.

LEAF COLLECTION

Quantitative criterion will allow for a partial assessment of the student leaf collections. In this case, 25 samples from deciduous and coniferous trees are required.

a) Did the student meet the 25 sample requirement? If not, how many are in the collection?

b) Try to determine how the student gathered their collection (intrapersonal challenge - "I did it myself" versus interpersonal - "I got my dad to get all the leaves.").

Note in intro to project and in assessment: Make sure that the parents did not do <u>all</u> the work, even though they will be involved in driving the child to various locations for species. Encourage them to lead the child to the tree, but require that the child use a field guide first to try to identify the tree.

c) There will be a certain amount of swapping and sharing of leaf specimens between classmates as the deadline approaches. Try to determine if the student fell short of only a few leaves or of a dozen before borrowing. *Caution students to work in pairs in this case to identify the leaves or for the "lender" to not reveal the name of the tree in order to encourage the borrower to identify it with the help of a field guide.*

Qualitative criteria for leaf collection assessment are as follows.

d) ACCURACY: How accurately did the student identify leaves and branches (coniferous/ deciduous, single/compound leaf)? *(Note that accuracy will reflect visual, logical, and linguistic intelligences).*

e) LOGICAL ORGANIZATION: Did the student arrange their leaves and branches logically? Did he/she group coniferous separately from deciduous? Did he/she group fruit trees together, heavily flowering trees together? Or is the collection just a random group of samples pasted and bound together? *(Note that accuracy will reflect visual, logical, and linguistic intelligences).*

f) VISUAL APPEAL: Did the student put visual/aesthetic energy into the organization of the collection? Is there an elaborate cover? Are the samples neatly affixed? Were the leaves chosen with an eye for beauty or did the student grab rotted leaves from the ground? Did the student go beyond the requirements to include samples of cones, seeds or bark?

g) VERBAL-LINGUISTIC: Did the student spell names correctly? Did the student exceed requirements (name, deciduous /coniferous, simple/ compound) to add average tree height, Latin name?

Assess each student's other projects and participation.

I. Linguistic: TREE BIOGRAPHY, POEMS

a) Did the student submit any of these items?
b) Are the details accurate, is the piece imaginative, is the writing grammatically correct?

II. SOUND EXPERIMENT AND MUSICAL PIECE

a) Did the student get involved listening to sounds of different trees' leaves and branches rustling in the outdoor environment?
b) Did the student choose to compose a piece of music that represents sounds of several types of rustling leaves and coniferous branches (ie. quaking aspen, oak, white pine)? Were his/her rhythms, selection of instruments, tone distinctive per tree?
c) Did the student elect to write a paper on the different woods used to making different types of musical instrument bodies or reeds? Evaluate.

III. Logical-Mathmatical

a) Did the student properly identify and collect 25 specimens?

b) Did the student attempt to estimate the number of leaves on maple trees of increasing heights? Did the student draw a graph to demonstrate findings?

c) Did the student record estimates of the average height of the tree with each leaf specimen in the collection?

d) Did the student delve beyond leaf identification and tree classification? Did the student examine any logs or firewood to try to determine the tree's age from the rings? Did the student try to correlate hard and soft wood with function of leaves and needles?

IV. Spatial-Visual

a) Did the student correctly identify trees by analyzing leaf shape? If the leaf shape wasn't distinctive enough for identification, did the student use other visual clues: height, shape, location of tree?

b) Was the student able to locate visually leaves by photo or sketch in field guides and tree books?

c) Did the student draw or paint a picture of their favorite tree for the tree biography or poem?

d) Did the student go beyond the contract and enthusiastically delve into visual arts to enhance their collection or other projects?

e) Did the student make leaf wrapping paper or come up with other unique projects that demonstrate their familiarity with shapes, colors and textures of various leaves and coniferous branches?

V. Bodily-Kinesthetic

a) If the student did a mime of a tree, how effective did he/she communicate its uniqueness?

b) Did the student make the most out of the overnight trip to the forest? Did he/she touch, smell, climb on trees, use the time to gather leaves for collection, run through the woods, sit under a tree?

VI. Interpersonal

a) How well did the student get along with others on the field trip? Did the student share responsibilities, observations, contribute to discussion?

b) In the classroom, did the student share observations, make hypotheses, contribute to discussion, give feedback to others, help weaker students organize their materials, work effectively in small groups?

VII. Intrapersonal

a) Did the student meditate under one tree over one week's time and reflect in journal?

b) Did the student compare subjective feelings about trees and leaves with objective data in a prose piece?

c) Did the student focus and concentrate on the projects to fulfil the contract, meet the challenges?

d) Is the student satisfied with his/her work products, understanding of classification of trees, ability to identify trees by leaves and coniferous branches?

Postscript:

In going through this exercise of devising science lessons teaching for and with MI and then writing up an assessment strategy, it is obvious that they are so closely interrelated. An analysis of the appropriateness of various assessments leads back up to a reevaluation of the structure and effectiveness of the lessons!

What follows is an assessment sheet for teacher's recording both observations and qualitative and quantative assessments of students (based on above narrative).

Student: _____ **Date**_____

Assessment for Leaf and Tree Unit: note short comments, checks indicating work completed, special projects underlined with remarks

LEAF COLLECTION

Quantitative criterion: 25 samples required, _____ submitted
borrowed extensively from other kids?
heavy parent involvement?

Qualitative criteria:
ACCURACY:
LOGICAL ORGANIZATION
VISUAL APPEAL
VERBAL/labels, text

Quantitative criterion:
completed ___ of 4 items agreed upon in contract

I. Linguistic: TREE BIOGRAPHY, POEMS

accurate, imaginative, writing grammatically correct

II. SOUND EXPERIMENT AND MUSICAL PIECE

listened to sounds of rustling trees outdoors for identification
composed, performed music of rustling leaves
research report on wood in musical instruments

III. Logical-Mathmatical

properly identify and collect 25 specimens
estimated number of leaves on maple trees of increasing heights, drew graph to demonstrate findings
recorded tree height for each leaf specimen
determined the tree's age from rings
researched correlation between hard and soft wood with function of leaves and needles

IV. Spatial-Visual

identified tree by leaf shape, used visual clues: height, shape, location of tree

able to use field guides by photos

drew or painted picture of favorite tree

used visual arts to enhance collection, other projects

made leaf wrapping paper

demonstrated familiarity with shapes, colors and textures of various leaves and coniferous branches in visual arts projects

V. Bodily-Kinesthetic

performed mime of a tree

overnight trip: touched, smelled, climbed on trees, used the time to gather leaves, danced around campfire, helped prepare meals

VI. Interpersonal

got along with others on the field trip, shared responsibilities, observations, contributed to discussion

in classroom, made hypotheses, contributed to discussion, gave feedback to others, helped other students organize materials, worked effectively in small groups

VII. Intrapersonal

meditated under one tree daily over week's time, recorded in journal

compared subjective feelings about trees and leaves with objective data in prose

focused, concentrated, fulfilled the contract, met new challenges

satisfied with his/her work products, understanding of classification of trees, ability to identify trees by leaves and conifer branches

Other Remarks:

PAWLET SCHOOL DISTRICT
Pawlet Primary School
West Pawlet Elementary School
PAWLET AND WEST PAWLET, VERMONT

EVALUATION OF MULTIPLE INTELLIGENCES

Student Name_____ School Year_____

Teacher_____

It is the goal of the Pawlet School District to help each child to develop to the maximum of his/her potential. We believe that children develop at independent rates. Growth is continually encouraged by guiding each child in a manner compatible with his/her ability and developmental age.

This checklist for multiple intelligences is an initial evaluation of a student's spectrum of intelligences. It offers indications rather than conclusions. As we believe that each child has the potential to succeed through a variety of learning capacities or "multiple intelligences", we have included seven major intelligences and subcategories. The total assessment of each child's progress in school consists of this written report as well others, balanced with reviews of regular classroom participation and examples of students' work.

PLACEMENT

Grade This Year _____
Grade Next Year _____

EVALUATION OF MULTIPLE INTELLIGENCES

Checklist

Frequency Scale: 3 - almost always 2 - frequently 1 - seldom or never
U - unknown or not observed

VERBAL / LINGUISTIC	3	2	1	U
Listening				
Listens attentively to ideas of peers and adults				
Listens with understanding and retains information				
Speaking				
Expresses thoughts clearly				
Speaks persuasively and effectively				
Expresses original ideas				
Uses imaginative figures of speech				
Displays sense of humor				
Writing				
Writes creatively				
Sequences and orders ideas in fiction and non-fiction writing				
Possesses an increasingly complex vocabulary				
Reading				
Reads independently and eagerly				
Reads a wide variety of literature: fiction, poetry, plays				
Reads technical writing and non-fiction: science, social studies, history				
Recalls facts verbatim				

LOGICAL / MATHEMATICAL	3	2	1	U
Mathematics				
Understands and applies math processes				
Recognizes, interprets and constructs graphs and patterns				
Makes comparisons				
Estimates				
Solves complex computational problems				
Solves complex word problems				
Demonstrates time management				
Science				
Observes carefully and accurately				
Formulates questions and hypotheses				
Designs and/or implements experiments				
Transforms concrete to abstract easily				
Displays common sense				

Frequency Scale: 3 - almost always 2 - frequently 1 - seldom or never
U - unknown or not observed

MUSICAL / RHYTHMIC	3	2	1	U
Seeks out opportunities to hear music				
Enjoys creating music				
Is sensitive to rhythm and changes in tempo				
Displays ability to produce tone or pitch				
Remembers melodies and can repeat them				
Plays a musical instrument				
VISUAL / SPATIAL				
Recreates visual experiences on paper				
Describes visual experiences orally				
Expresses visual images in a variety of media and techniques				
Appreciates visual images in a variety of media and techniques				
Creates images and products with respect for their quality and character				
Demonstrates an appreciation of balance and order or asymmetry				
Reads maps and can reproduce them easily				
BODY / KINESTHETIC	3	2	1	U
Demonstrates fine motor skills				
Demonstrates strong gross motor skills				
Participates skillfully in sports activities				
Responds to music through dance				
Enjoys and initiates activities requiring physical exertion				
Uses body or face in dramatic ways to evoke emotional response				
INTRAPERSONAL	3	2	1	U
Demonstrates mindfulness / awareness of the environment				
Demonstrates awareness and expression of different feelings				
Displays higher level thinking and reasoning skills				
Has sense of self				
Has self-confidence				
INTERPERSONAL	3	2	1	U
Takes on leadership role				
Is looked to by others for decisions				
Is sensitive to the intentions, behavior and perspectives of others				
Works cooperatively in groups				
Enjoys organizing and bringing structure to situations and activities				
Shows ability to role-play, improvise and think up solutions "on the spot"				
Communicates effectively verbally and non-verbally				

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Patty Winpenny
January 4, 1993

MI, Science Curriculum and Assessment

LEAF (and NEEDLE) COLLECTIONS: Organization of Living Things

1. Linguistic:

Tree poem: write a poem about your favorite tree.
Read a poem by Robert Frost about a tree.
Write a biography of your favorite tree.

2. Musical:

On a windy day, go outside and listen to the sounds of rustling leaves. Does a large maple sound like a quaking aspen in the wind? Compare the sounds of deciduous and evergreen branches rustling in the wind. If you were blind, do you think you could tell the difference?

Compose a song on the glockenspeil or bells or other instruments that represents the sounds of falling leaves.

Follow up: are different woods used for different types of musical instruments? Research.

3. Logical-mathmatical:

Examine single and multiple leaf branches.
Estimate the number of leaves on a maple tree that is five feet high, 10 feet, 20 feet, 30 feet high. Do you think the number of leaves increases in multiples of ten or in another multiple? Explain.
Estimate a tree's age from the rings. Examine a trunk of a deciduous and a coniferous tree. Are they similar?

4. Spatial-Visual

Arrange your leaves in a binder for a collection. Make an interesting cover for the collection.

Draw or paint a picture of a deciduous and coniferous tree.

Draw a maple tree in the four seasons. What colors do you use?

Examine the breakdown of a bright red maple leaf as it dries up over time. Record the color changes.

Examine the color changes daily on a maple tree near your home.

Make holiday wrapping paper. Dry beautiful autumn leaves. Paste them on white paper or spray paint them gold first.

5. Bodily -Kinesthetic

Go for a walk in the woods. Gather leaves and coniferous branches with needles for your collection.

Do a mime of different trees shaking in the wind or of one tree in different weather.

Examine one tree: climb in it, touch it, smell it, dance around it, run around the perimeter of its shadow.

6. Interpersonal:

Organize a class day trip to the woods to examine trees and gather leaves for collections.

Organize a blind-walk through the forest. Try to identify trees blindfolded.

Organize an overnight camping trip to the forest. Gather leaves for collection, discuss forest management, how different wood burns differently for campfires.

Invite parent foresters into the classroom to lead the discussion and review of the leaf collections.

7. Intrapersonal

Find a special tree. Go to it when you are feeling happy, sad, depressed, energetic, or lazy. Write in your journal. Do you become "friends" with the tree? Does the same tree seem different to you when your mood is different?

Describe your favorite tree and why it appeals to you.

Assessment:

Teacher will examine and evaluate the students' work and involvement with the leaf study throughout all phases of the projects.

Certain criterion set by class and teacher will allow for a quantitative evaluation: how many leaves and evergreen branches were required for project? How well does the student demonstrate knowledge of the differences between coniferous and deciduous, single and multiple leaf branches?

Teacher and students will come up with a contract in which the student sets a goal and heads toward accomplishment. Each student chooses from three or four of the MIs for the final evaluation.

There will be concrete examples of students' work: leaf collections, journal, tree poems, wrapping paper, mime or song performance.

M.I. Implementation Survey
Fawlet Schools
John Duval - Castleton State College

Instructions:
I'm trying to collect some information about the effects or carryover from our work last year. Would you help me by answering the following questions and returning your responses to Nancy by the end of school Monday, March 7th?
Many thanks.
John Duval

1. ince becoming familiar with M.I. Theory, my teaching has changed.

Yes ☐ No ☐ If yes, how?

2. Since becoming familiar with M.I. Theory, my classroom has changed.

Yes ☐ No ☐ If yes how?

3. Since becoming familiar with M. I. Theory my relationship with my colleagues has changed.

Yes ☐ No ☐ If yes how?

4. Gregory Bateson said"What is true is that which stays true longer than what is not so true..." (Bateson, 1981, p 162.) Is M. I. Theory true? Comment if you would.

5. This is your question space. Please write your own question and answer it.

M.I. Implementation Survey from the Pawlet Schools

John Duval - Castleton State College, Castleton, Vermont
Nancy Mark - Pawlet Schools, Pawlet, Vermont

Following are responses from Pawlet teachers about the effects and impact of our work on multiple intelligences on teaching and learning in our schools.

1. Since becoming familiar with M.I. Theory, my teaching has changed.

* "Now I understand it is more than a 'learning style'; it is an empowering intelligence or group of intelligences. Recognizing this has allowed me to target a student's dominant intelligence and teach through it to enable the student to achieve greater success in many curricula areas."

"It is much easier to mainstream my special education students by helping them select a project to do (within the class theme of study) that uses their unique group of intelligences (it. having a student examine a book of photographs of ancient Egyptian artifacts, select the cat mummy to draw and calculate how many generations ago was the time period). Only then are we ready to launch into the more general material ."

* "I have become more aware of each students's important talents, not just the traditional talents. I also have encouraged students to experiment in other areas where they may not have had a previous strength but have now gained proficiency. "

"In writing, for example, students are allowed to illustrate a composition or compose the drawing first and then write the piece. A student who is very artistic but refused to write is now writing very good pieces."

* "I was aware that we all have our own strengths and weaknesses, but becoming familiar with M.I. Theory showed me that I usually taught in a style that was compatible with my own intellectual profile. Now when I plan an activity for a specific student, I consider his or her intellectual strengths and weaknesses, not my own."

* "As a teacher I have always respected the different strengths that my children have brought with them to school. My teaching has changed in that now I view all the different strengths as "intelligences" and try to include them in my planning."

* "I realized that our environment of mostly verbal / linguistic or mathematical was not meeting the needs of all my students...The assessment piece fits so well into M.I."

* "I think of how the curriculum I am teaching will include all 7 of the intelligences..."

* "I am much more focused on recognizing all the intelligences in my students rather than concentrating all my energies on the traditional linguistic and logical / mathematical areas. I include project suggestions in all areas and encourage students to use their strengths and develop the intelligences which aren't so strong."

* "I have tried to provide students with learning opportunities which enhance their dominant intelligence, as well as those which will foster the development of subsequent intelligences. It is my goal to then teach children to apply what they have learned through their intelligences to everyday life."

* "Within each unit of study, I have encouraged students to create projects which will feature their dominate intelligence, as well as experiment with projects that will strengthen their other intelligences."

2. Since becoming familiar with M.I. Theory, my classroom has changed.

* "Now, rather than feel my approach is eclectic, I can integrate it with the classroom teacher's program. The focus is on the students' success rooted in their strong intelligences, but within the context of the whole classroom. I can devise activities to help them teach one another through their strong intelligence and socializing styles that also reflect their dominant intelligences."

* "I think many things have changed about my classroom because all of the seven intelligences are being honored by me as well as by my students. The students are willing to give each other credit for many different things."

* "My classroom has changed in that I have purchased and set up more areas in which children can explore a particular subject area."

* "Even though I have a very limited space, I set up centers that allow children to learn through a variety of experiences...I have purchased new items for my classroom with M.I. in mind."

* "We are working more cooperatively and children are sharing more. They get more choice in the way they would like to learn and share."

* "Since this is the second year we have emphasized multiple intelligences to our students, they are more familiar with recognizing strengths in each other in all areas and are very accepting of individual differences."

* "I also have designated other spaces around the room which also support the multiple intelligences."

3. Since becoming familiar with M.I. Theory my relationship with my colleagues has changed.

* "Following from question #2, the classroom teacher and I work much more closely focusing on the special education of 'my students.' This has resulted in our recognizing our own M.I. strengths and weaknesses; at times, she delegates to me the task of helping students within the whole classroom focus on projects requiring visual / spatial and hands-on skills. I do not feel as alienated or as 'belonging' to my two designated students and feel part of a whole school faculty effort."

* "It has given us a common language with which to discuss and look at individual students and programs. It has created a challenge to everyone to look for and use different intelligences in units we have presented previously."

* "My colleagues and I are always bounding ideas off each other and discuss how we can incorporate all the intelligences in our plans. A teacher with a strength in the musical area, for example, can give me a better way to make sure the musical intelligence is being honored. We are also in the process of creating a new report card reflecting the seven intelligences."

* "I don't think my relationship with my colleagues has really changed, but because of learning more about the M.I. Theory, our discussions about curricula have taken on a new dimension."

* "Our relationship has always been one of sharing and collaboration. M.I. has given us more to share!"

* "Actually the relationship between the staff members in our school has always been very good...Since the special Ed aid in my room also was part of our M.I. training, we find ourselves working toward a common goal of inclusion for our special Ed students. We also are constantly looking for clues to students' strengths."

* "I think the changes in our relationships have primarily been subtle ones. We now speak a common language with which to build upon."

4. Gregory Bateson said, "What is true is that which stays true longer than what is not so true..." (Bateson, 1981, p. 162). Is M.I. Theory true? Comment if you would.

* "M.I. Theory is 'true' in that it is a theoretical approach with multiple pragmatic and practical influences on curriculum design and classroom management strategies (what and how to teach to whom), implementation of which has produced a large body of empirical evidence that the theory is true and functional. Future neurological research and classroom practice may add intelligences to the M.I. constellation."

- "Yes, we have used many of its components in our teaching. Now we continue to learn and look at new ways to increase students' involvement and success in their own learning. We also continue to evaluate ourselves as learners and teachers using this theory."

- "I think many teachers view several of Gardner's M.I.'s as special talents rather than intelligences traditionally addressed at school. The M.I. Theory is 'true' in that it looks at and values the while child and how he / she learns best."

- "How can it not be? How can we expect everyone to learn the same way?... What's true to an individual is a learned, internalized experience."

- "I believe 'born' teachers from centuries past to present have been keenly aware of M.I....So, yes, I believe this theory whether called M.I. or by another name will stay true longer."

- "The more I learn about it, the more I understand my students and the more ways I find to help them reach their full potential."

5. <u>This is your question space. Please write your own question and answer it.</u>

- "... My view of testing has changed. Especially in special education, I was skeptical of 'tags' on kids. I always respected the natural intelligence that predominated in a student (it. great draftsman, mechanic) and tried to ignore - optimistically - the constellation of LD labels by teaching to what they could do best...Now, since the faculty is supportive of M.I. Theory, it seems that teachers wholeheartedly compliment the LD students for their achievements outside the traditional linguistic and logical / mathematical fields. In my students' cases, this acceptance seems to be leading to much greater success in the latter two fields. The process of learning itself is the test. The concrete projects, collaborative energy and yearning to achieve the next level are the real 'test' results."

- "Will I continue to use M.I. Theory in my classroom? Yes, it is wonderful to see students become aware of the special abilities of students whom they often see as those with few successes."

- "Is the theory of M.I. important in schools? I think the theory is very important because it gives students a way to use their own individual strength to become successful."

- "Will there be M.I. 'pills' we can take to activate our brains to develop in these areas??"

- "How do we create a meaningful assessment which reflects all modalities of learning rather than the 'traditional' I.Q. intelligences?"